

Economic Models for Integrated Project Teams

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The dots of evidence

- Lower cost premiums
 - 0.66% to 2.11% for Basic through Gold LEED
 - 6.5% for Demonstration/Platinum buildings
 - Premium declines with collective experience
- Clear energy benefits
 - 18% to 37% reductions from code
 - Additional benefits with renewable energy sources
- Increased “soft” benefits
 - Reduced external costs -- atmospheric, ground and water pollution
 - Economic and social impacts -- up and downstream
- Greater human health and productivity

“Soft” Benefits Data

- Academic test scores
- Retail sales
- Retention
- Productivity

Indirect accrual of benefits

- Developer, tenant relationship
- Owner, user relationship
- Separate accounting for capital and O&M budgets



Challenge for green laboratory advocates

- Develop strategies for understanding common ground between building owners/developers and users/tenants
 - Valuation of sustainable design features
 - Requires financial linkages

Design Drivers -- Common Ground



Conventional Strategies for Success

- **Faster** Reduce time to occupancy
- **Cheaper** Reduce construction cost
- **Bigger** Increase leasable/usable space
- **Better** Increase capacity (enhance marketability)

Green Strategies for Success

- **Faster** Reduce time to occupancy
(permitting advantage)
- **Cheaper** Reduce operational & construction costs
- **Bigger** Increase effectiveness of space
- **Better** Provide strategic flexibility
(enhance marketability)

Case Studies -- Financial Model Components

ROI, NPV

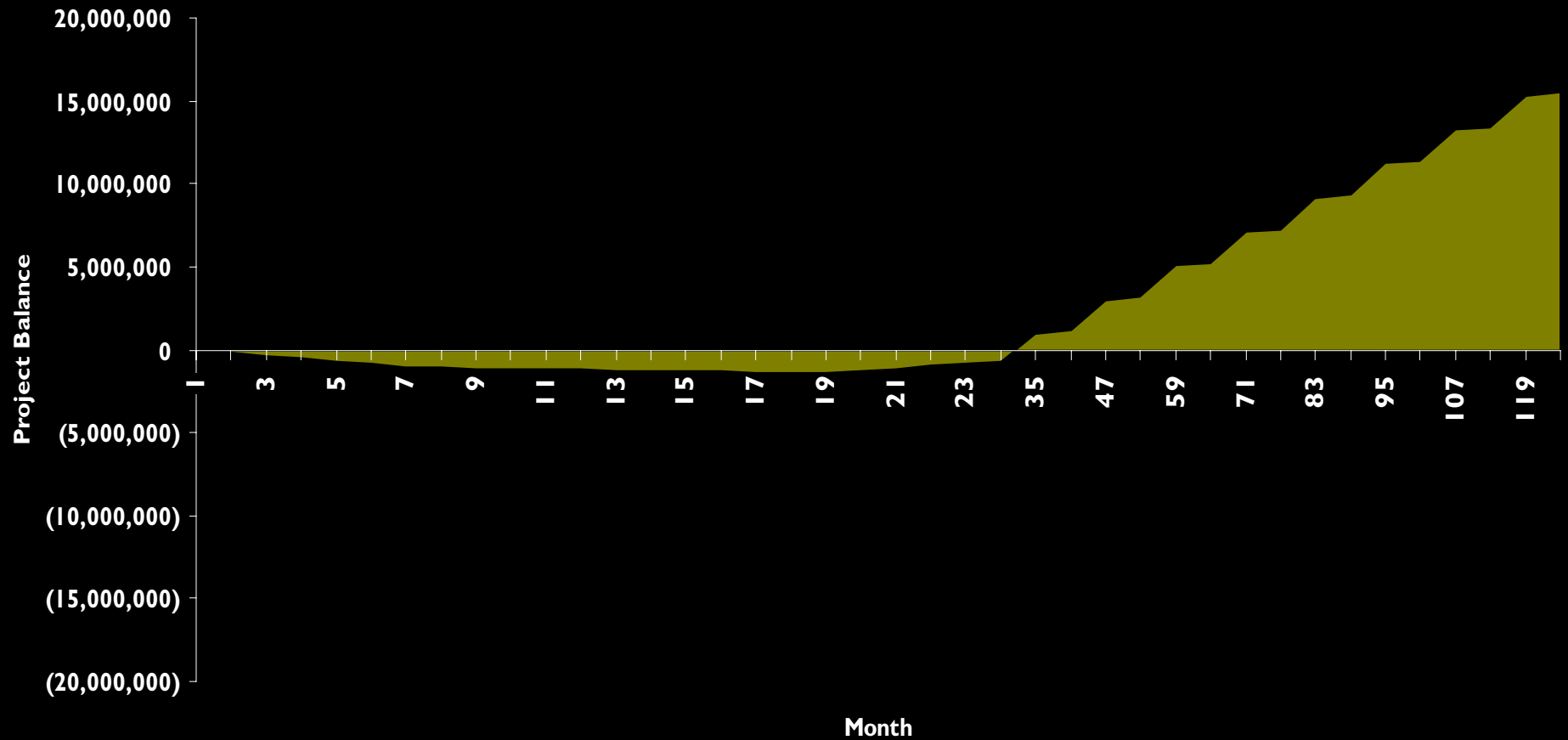
Clark University



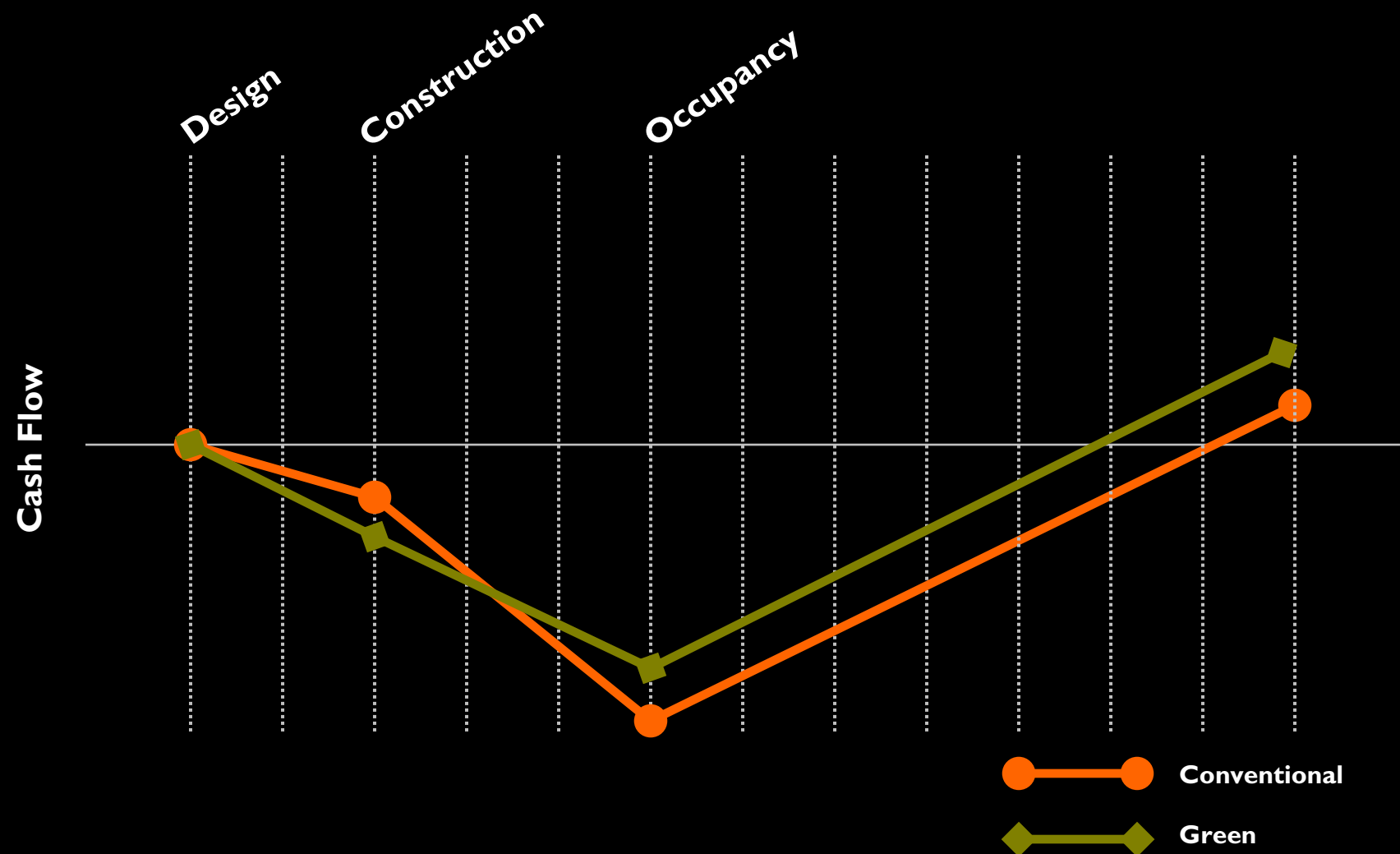
- Institutional owner
- Fixed budget and schedule
- Key objectives:
 - Recruitment
 - Retention
 - Operational costs
 - Fundraising

Clark Financial Model

10 Year Total Net cash flow



Clark University



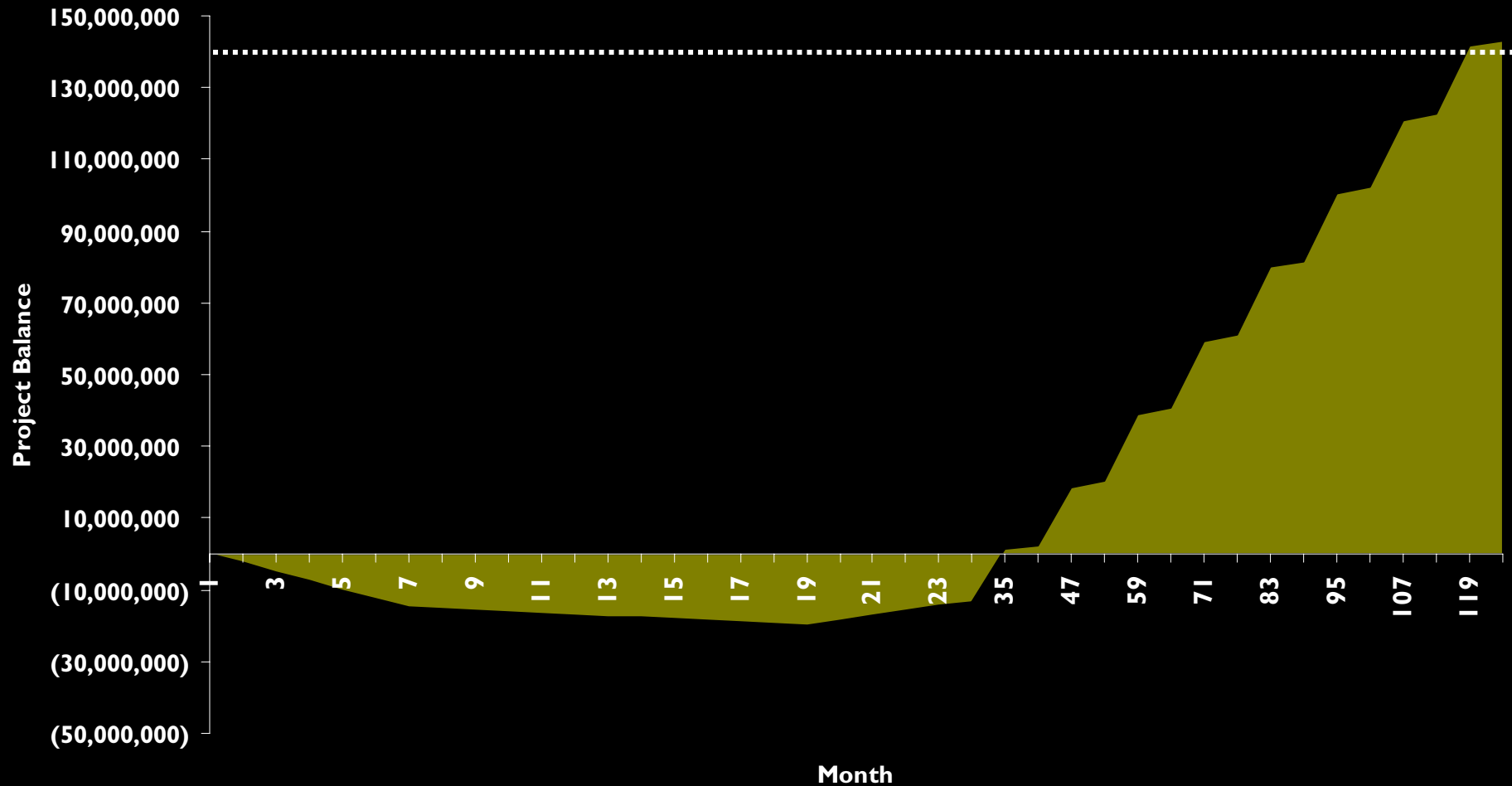
Medical Research Buildings

- “Speculative” development
- First costs minimized
- Risk averse
- Tenants to be determined
- FAR envelope at limit



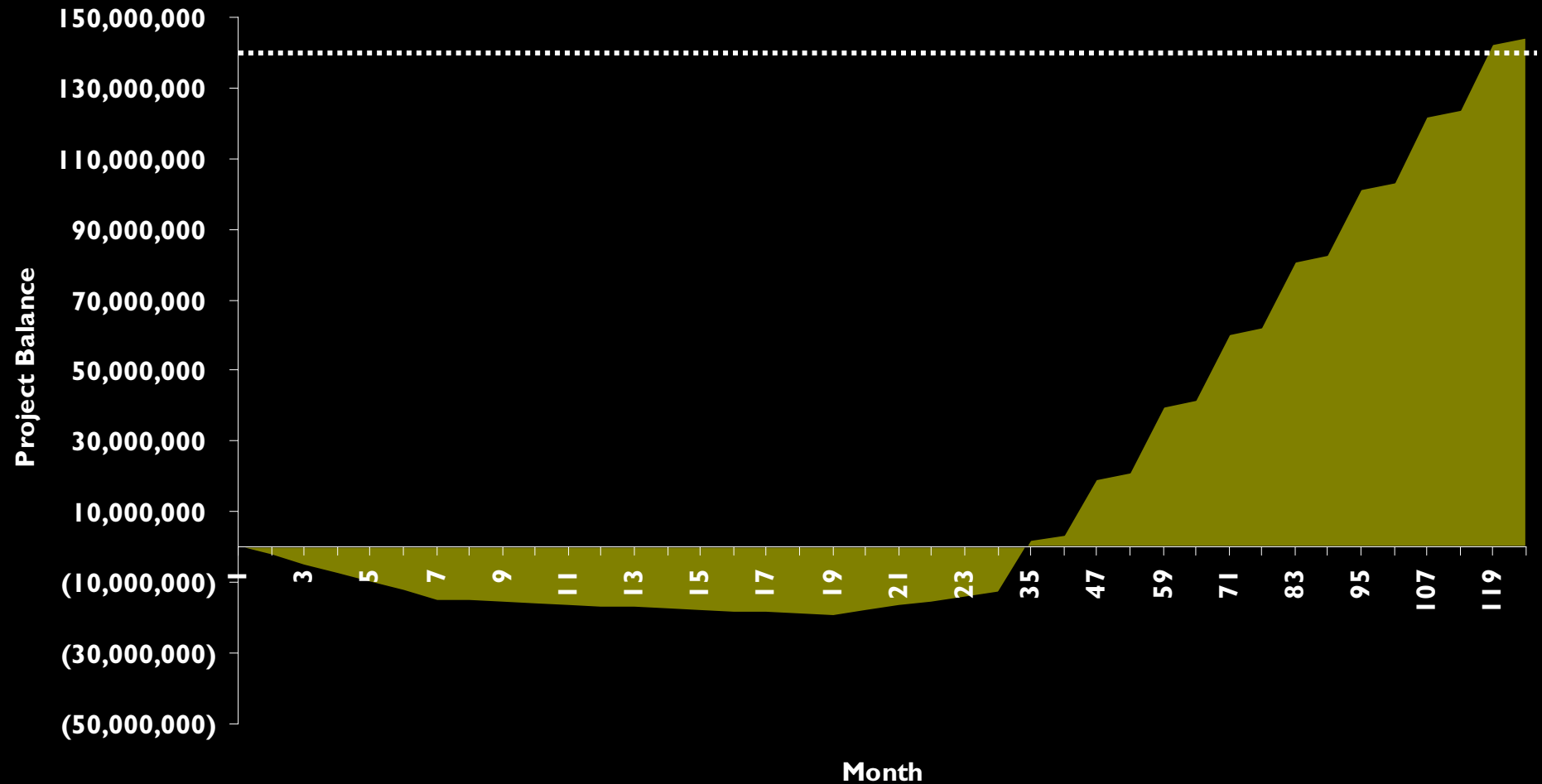
Medical Research Buildings – Base Model

10 Year Total Net cash flow



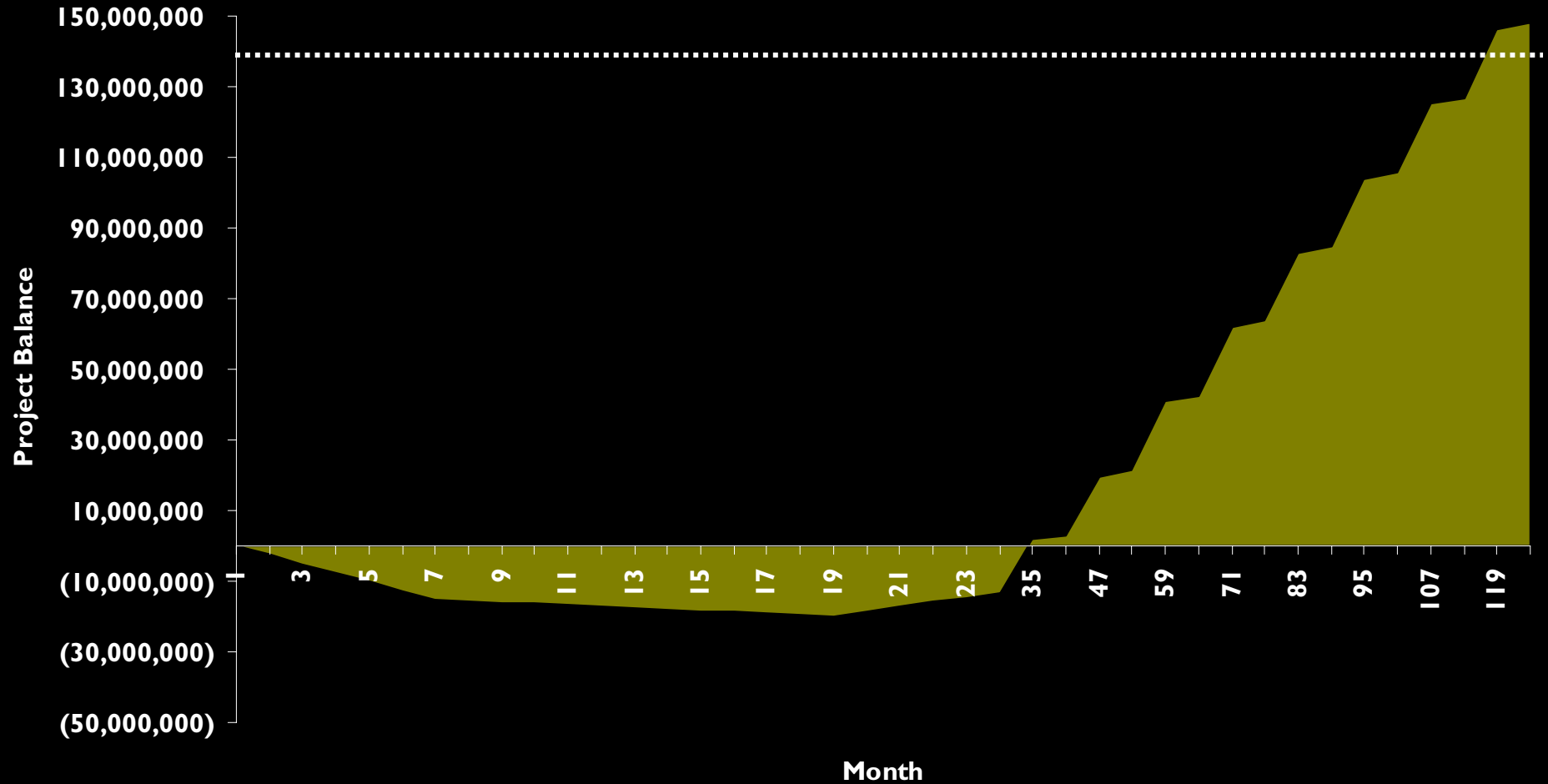
Option I – Parking

10 Year Total Net cash flow



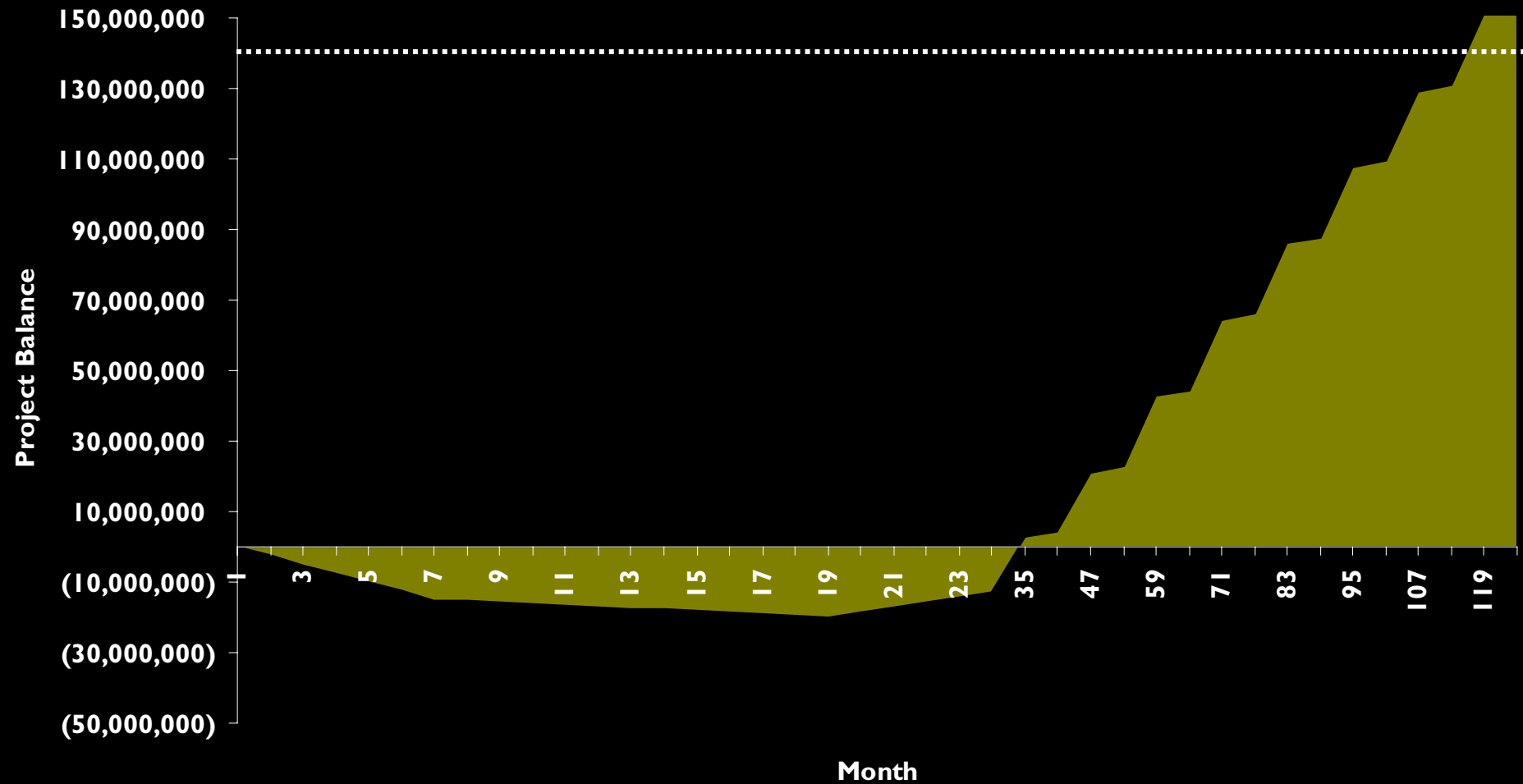
Option 2 – Reduced Energy

10 Year Total Net cash flow



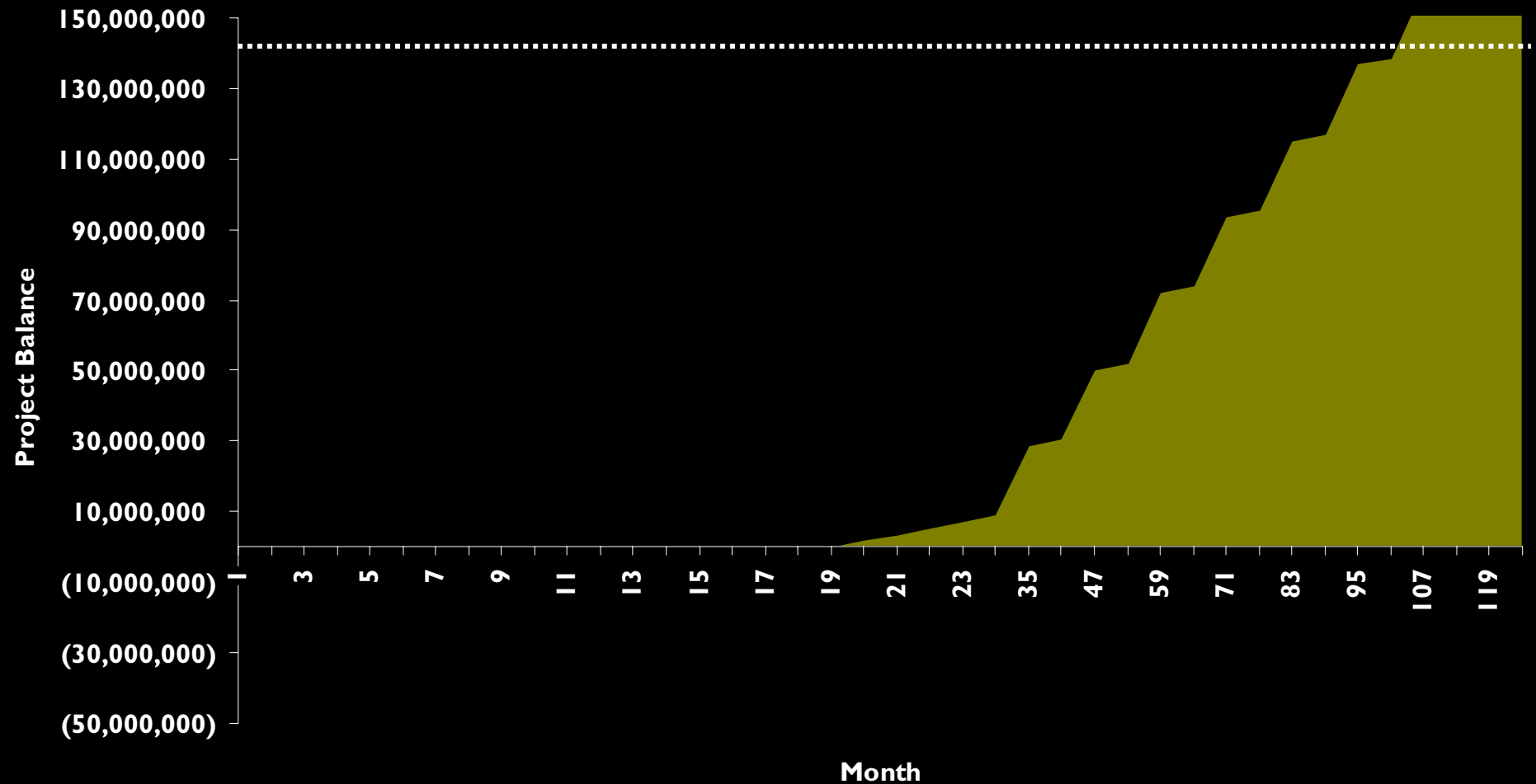
Option 3 – Increased Lease

10 Year Total Net cash flow



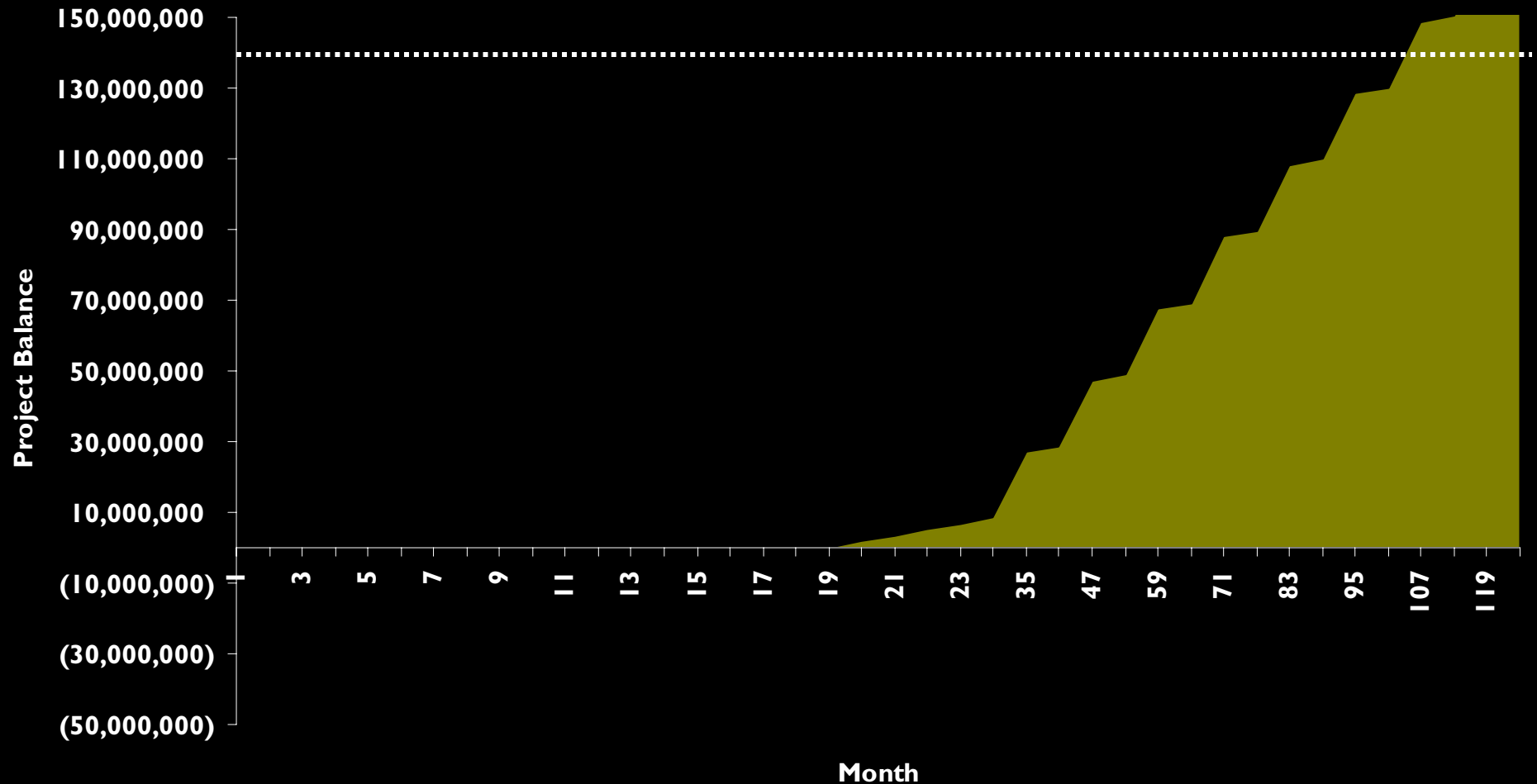
Option 3A - Increased Lease/Base Staff

10 Year Total Net cash flow



Option 3B – Increased Lease/Staff

10 Year Total Net cash flow



Summary of Studies

		NPV (\$M)				NPV/SF (\$)						
		Base	Improved		Delta		Base	Improved	Delta			
Clark												
Reduce construction (\$0.90/sf)	\$	7.64	\$	8.19	\$	0.55	\$	109.14	\$	117.01	\$	7.87
Increase Fee (+6% of fees)												
Reduce utility costs (-45%)												
Medical Research Building												
	\$	72.53										
Option 1 -- Reduce Parking	\$	72.53	\$	73.30	\$	0.77	\$	145.06	\$	146.60	\$	1.54
Assume reduction of 10%												
base is 4.5 spaces per 1000 sf												
underground parking at \$50k/space												
Option 2 -- Reduce Utility Costs	\$	72.53	\$	75.16	\$	2.63	\$	145.06	\$	150.32	\$	5.26
Add 0.3% to construction												
Add 1% to engineering fees												
Save 30% in utility costs												
Option 3 -- Increase Lease Rate	\$	72.53	\$	77.88	\$	5.35	\$	145.06	\$	155.76	\$	10.70
Increase lease by 5% (\$2.5 on \$50/SF)												
Increase productivity by 1% of												
Employee salary and benefits												
Option 3 -- Benefit to Tenant	\$	(97.44)	\$	(96.37)	\$	1.07	\$	(194.88)	\$	(192.74)	\$	2.14

The Green Market Lab Niche

- Employees at \$100,000 average cost (salary + benefits)
- Return 5% on productivity, recruiting retention and reduced absenteeism combined
- Add environmental stewardship to annual marketing appeal
- Benefits accruing to tenant
 - \$5,000/employee annually
 - Worth \$14.29/sf annually
- Boston Market break even
 - 1% productivity = \$2.86/sf annually
 - 5% lease hike = \$2.87/sf

Additional Strategies to Consider

- Streamline permitting -- reduce time to beneficial occupancy
- Increase FAR
- Provide performance based services -- s.a. Esco
- Build less, but higher quality/value
- Reduce insurance rates (cost/employee and cost/employer)

Bringing Green Design to Market

- Financial Model (Life Cycle Cost / Assessment)
- Address Key Variables
- Leverage Strategies